

Claims

- [c1] What is claimed is:
- 1.A back light unit disposed under a display panel, the back light unit comprising:
- a luminous means as a light source for providing light beams; and
- a diffuser interposed between the luminous means and the display panel for diffusing the light beams to the display panel, wherein the diffuser is composed of liquid crystal molecules and polymers and comprises a plurality of regions with different diffusion effects;
- wherein a region with greater diffusion effect is closer to the luminous means.
- [c2] 2.The back light unit of claim 1 wherein regions with different diffusion effects are formed due to absorbing different luminous quantities by using photo masks.
- [c3] 3.The back light unit of claim 1 wherein the region which is closer to the luminous means is composed of smaller liquid crystal droplets.
- [c4] 4.The back light unit of claim 1 wherein a location of the regions with greatest diffusion effect corresponds to a location of the luminous means.
- [c5] 5.The back light unit of claim 1 wherein a shape of the regions with greatest diffusion effect corresponds to a shape of the luminous means.
- [c6] 6.The back light unit of claim 1 wherein the diffusion effect of the diffuser changes according to an electric field applied thereon.
- [c7] 7.The back light unit of claim 6 wherein the back light unit further comprises at least one pair of electrode plates, with one plate disposed on each side of the diffuser for applying an electric field to the diffuser.
- [c8] 8.The back light unit of claim 7 wherein the electric field is according to a luminous intensity of the luminous means.
- [c9] 9.The back light unit of claim 1 wherein the diffuser is composed of polymer dispersed liquid crystal (PDLC) molecules.

[c10] 10. The back light unit of claim 1 wherein the back light unit further comprises a reflective layer disposed under the luminous means for reflecting the light beams to the diffuser.

[c11] 11. A diffuser adapted for a back light unit, the diffuser composed of liquid crystal molecules and polymers, the diffuser comprising a plurality of regions with different diffusion effects formed by different sizes of liquid crystal droplets.

[c12] 12. The diffuser of claim 11 wherein the region with greater diffusion effect is composed of smaller liquid crystal droplets.

[c13] 13. The diffuser of claim 11 wherein the diffuser further comprises at least one pair of electrode plates, with one plate disposed on each side of the diffuser for applying an electric field to the diffuser.